

ARK-C2503 - Digital Storytelling

DIGITAL DESIGN WORKFLOWS

SKILLS, METHODS, CONCEPTS

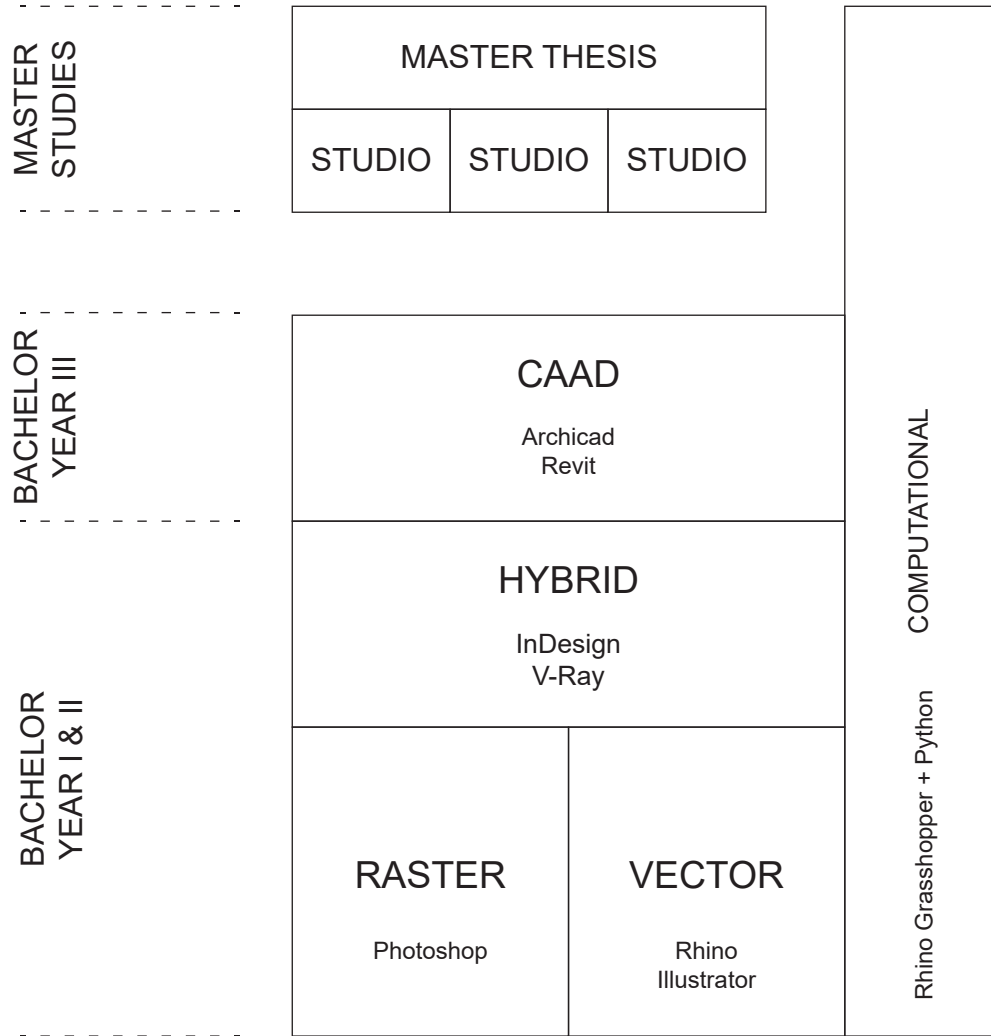


by Luka Piskorec

March 2021

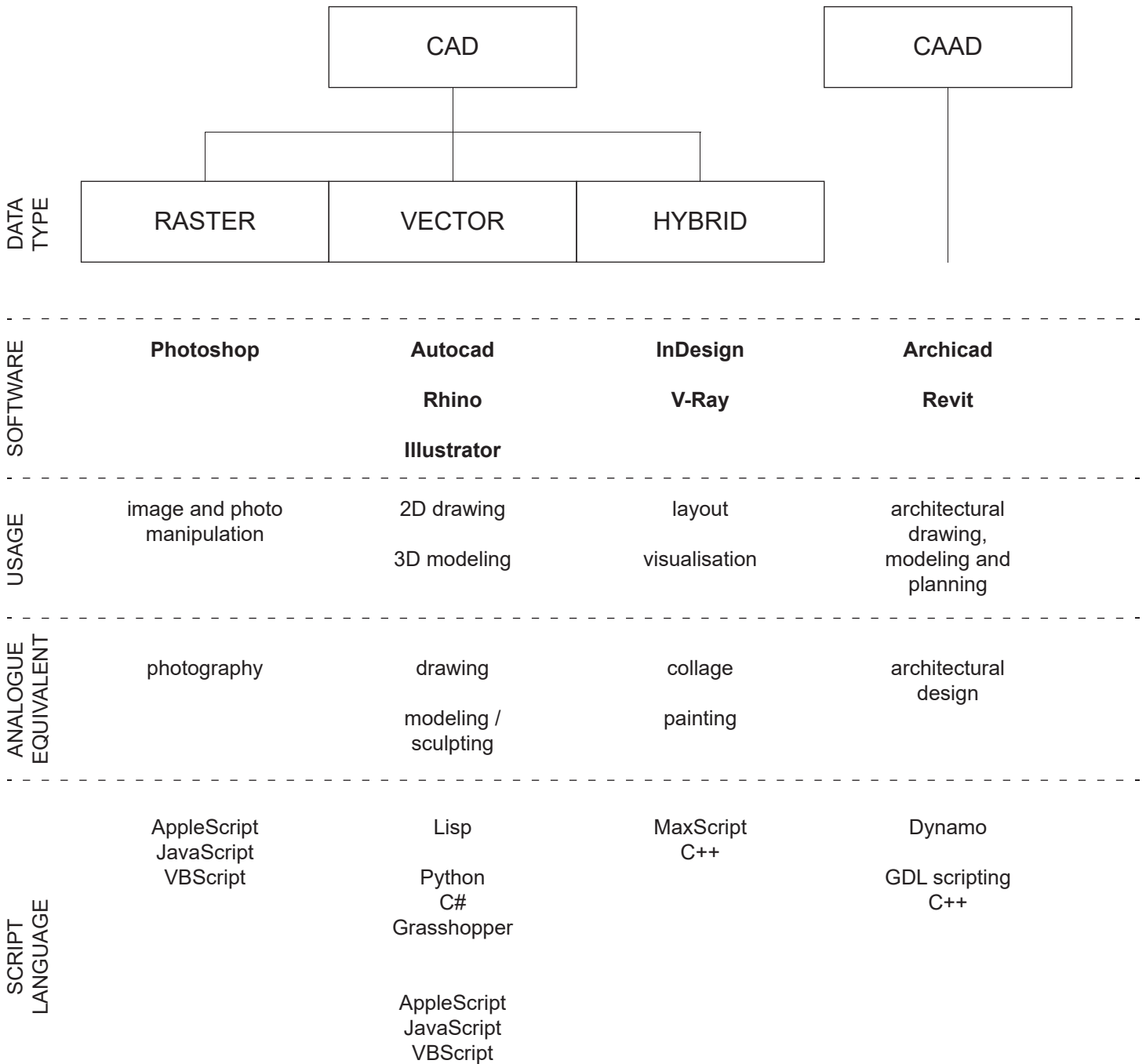
DIGITAL DESIGN WORKFLOWS

DIDACTIC CONCEPT

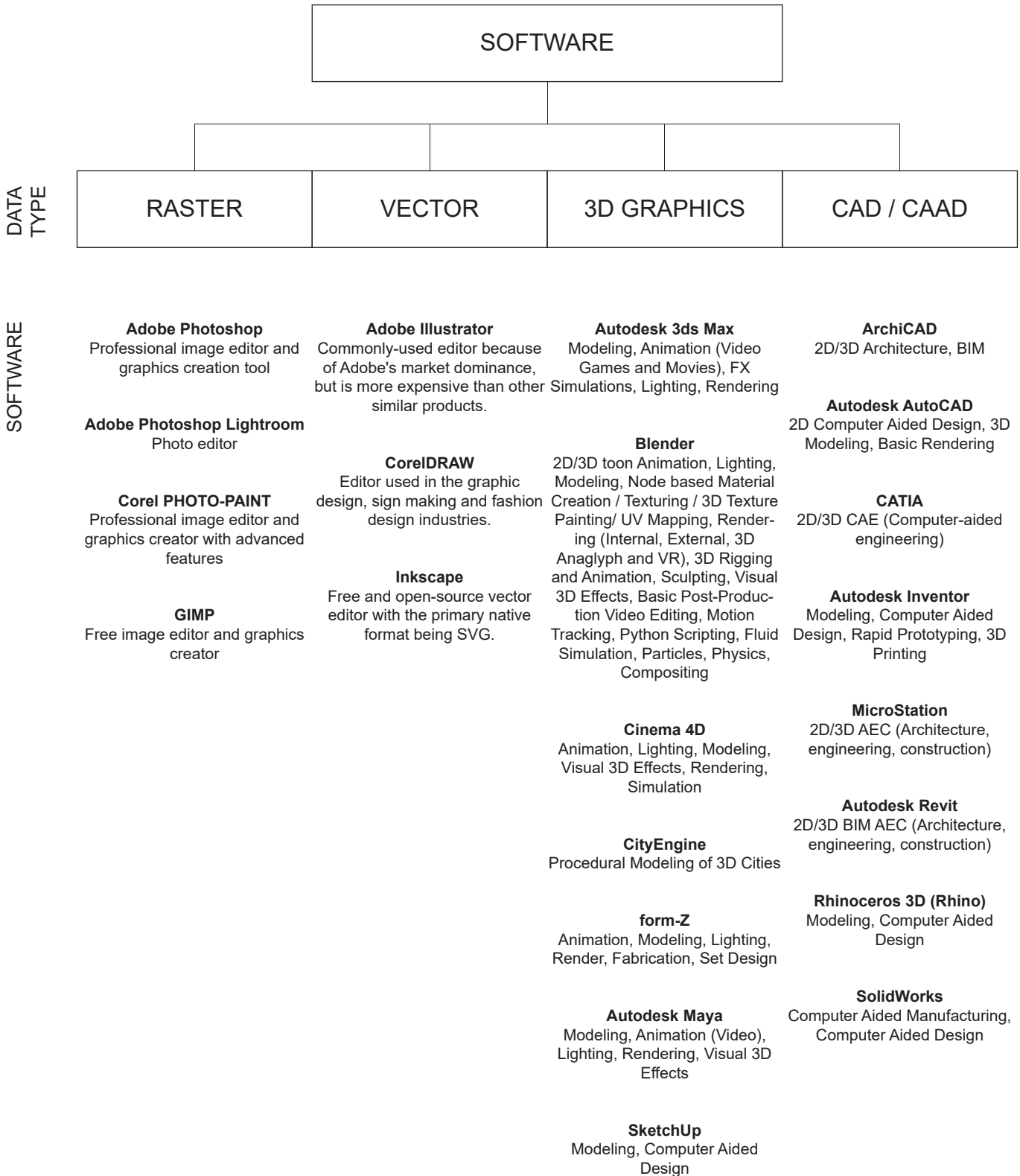


DIGITAL DESIGN WORKFLOWS

STRUCTURE



SOFTWARE COMPARISON



LEARNING TIMELINE

ADOBE CREATIVE SUITE

PHOTOSHOP

ILLUSTRATOR

INDESIGN

| YEAR | SEMESTER | PHOTOSHOP | ILLUSTRATOR | INDESIGN |
|----------|--------------|--|--|---|
| YEAR I | SEMESTER I | <ul style="list-style-type: none"> Global adjustments of images – color, tone, saturation, levels Object in the image - isolation, cutting out, removal, addition Operations on multiple images – recording an action and executing batch Renaming multiple images using Adobe Bridge | <ul style="list-style-type: none"> Importing a DXF drawing with layers, adjusting line weights, line types and line colors Exporting a drawing as PDF | |
| | SEMESTER II | <ul style="list-style-type: none"> Basic collaging (flat) - layers, transparency and blending modes Sourcing image material for collages Selection methods – object selection tool, select color range, quick mask mode | <ul style="list-style-type: none"> Creating illustrations starting from imported line drawings Fills, transparencies, using live paint bucket to color in the drawing Collaging line drawings with raster images | <ul style="list-style-type: none"> Importing image and vector data (from PDF) and creating a layout with text Using master pages Exporting a booklet as PDF Creating an InDesign package of the booklet |
| YEAR II | SEMESTER III | <ul style="list-style-type: none"> Advanced collaging (spatial) – importing external renders, photographs and drawings Retouching an image – paint brushes, blur, dodge, burn, spot healing brush, clone stamp tool Painting in shadows and exposures Arranging objects in perspective – perspective warp, grid, distort, free transform | <ul style="list-style-type: none"> Creating spatial illustrations using flat graphics, redrawing from a photograph Perspective and axonometry grids, painting in shadows and exposures Creating an atmosphere using color pallets | <ul style="list-style-type: none"> Automatic alignment of objects Flowing text between frames and pages Using scripts – place multi-page PDF in your document |
| | SEMESTER IV | <ul style="list-style-type: none"> Texturing using blending modes Unifying color and tone, recoloring the image | | |
| YEAR III | SEMESTER V | <ul style="list-style-type: none"> Creating time-lapse videos from an image sequence | | |
| YEAR VI | SEMESTER VI | | | |

LEARNING TIMELINE

RHINO COMPUTATIONAL DESIGN ENVIRONMENT

RHINO

GRASSHOPPER

PYTHON

| | RHINO | GRASSHOPPER | PYTHON |
|-------------------------|--|--|--|
| YEAR I SEMESTER I | <p>Setting up the workspace – units, grids, object snaps, layers, background, viewports</p> <p>Drawing simple line drawings in 2D – line, polyline, curve, arc, text, trim, extend, offset, split, join, explode, copy, distance, scale, rotate, group/ungroup, show/hide, zoom, pan</p> <p>Exporting a drawing as DXF and PDF</p> | | <p>Scripting editor functionality, running the code within Rhino</p> <p>Basics of programming - variables, lists, loops, conditionals, functions</p> |
| YEAR I SEMESTER II | <p>Simple 3D modeling with geometric primitives and solids</p> <p>Modeling polysurfaces, rebuilding, simplifying, boolean operations on solids – union, intersection, difference</p> <p>Unrolling planar polysurfaces</p> <p>Creating a 2D drawing from a 3D model - Make2D</p> <p>Exporting views as images</p> | <p>Setting up sliders and input parameters, connecting components</p> <p>Math operators, list creation and manipulation, sequences</p> <p>Points, lines, translations and rotations, vectors, planes</p> <p>Curve creation and analysis, division, curve primitives</p> <p>Euclidean transformations</p> | <p>Using Rhino functions with Python - rhinoscriptsyntax library, Rhino Common library</p> <p>Geometry foundation – vectors, transformations</p> |
| YEAR II SEMESTER III | <p>Using Rhino Layout – preparing plans for print to PDF</p> <p>Layer organization</p> <p>Line weights, line types, line colors</p> <p>Hatches, dimensions</p> <p>Surface extrusions from curves – extrude, loft, sweep, revolve</p> <p>Changing surface degree, smoothing, deformations</p> | <p>Surface creation and analysis, surface and solid primitives</p> <p>Geometry intersections, Boolean operations on geometry</p> <p>Affine transformations</p> | <p>Object oriented paradigm – objects, classes</p> |
| YEAR II SEMESTER IV | <p>Terrain modeling – creating a mesh / NURBS terrain model from external 2D plans</p> <p>Modifying the terrain with control points, excavation calculations, projecting geometry onto a terrain, subtracting and adding volumes, downhill direction mapping</p> <p>Contouring and sectioning the terrain model back into a 2D drawing</p> | <p>Mesh creation and manipulation</p> <p>Voronoi and Delunay triangulation</p> <p>Geometry morphing</p> | <p>Integration within Grasshopper GH Python Script</p> |
| YEAR III SEMESTER V | | <p>Field creation, manipulation, evaluation, particle simulation, metaballs</p> <p>Creating own components using GHPython Script</p> | |
| YEAR III SEMESTER VI | | <p>Environmental analysis – Ladybug, Honeybee</p> <p>Physics and material simulation – Kangaroo</p> <p>Structural analysis – Karamba3D</p> <p>Evolutionary optimization – Galapagos</p> | |

LEARNING TIMELINE

SPECIALIZED WORKFLOWS

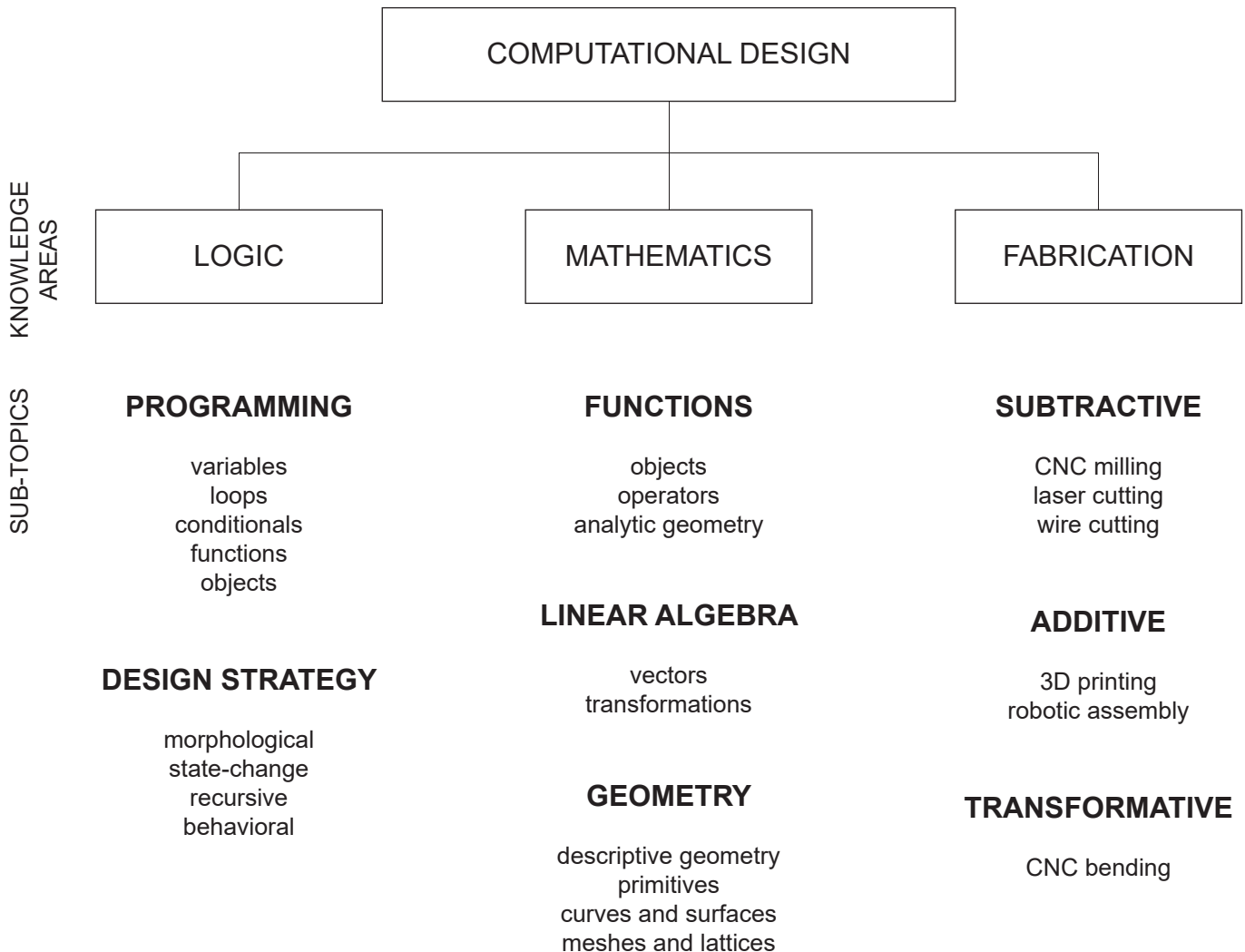
V-RAY

ARCHICAD / REVIT

DIG. FABRICATION

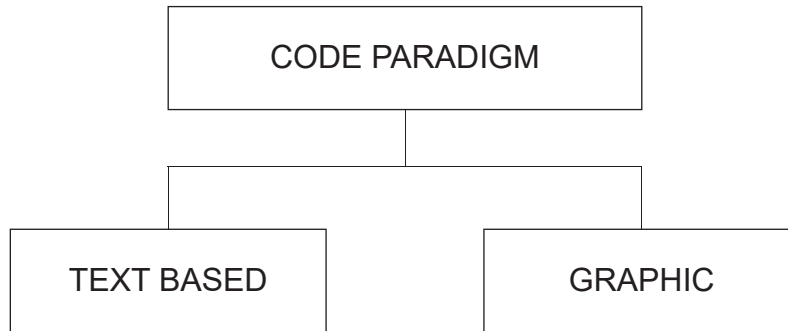
| | | | |
|----------|--------------|---|---|
| YEAR I | SEMESTER I | | Printing basics – printing on A4 and A3 |
| | SEMESTER II | | Laser cutter – exporting drawings and preparation, machine operation 3D printer – exporting 3D models and preparation, machine operation, fine-tuning of parameters |
| YEAR II | SEMESTER III | Importing a 3D model into the scene Setting up exterior lighting and exposure Defining and applying materials – glass, metal, stone, masonry, plaster, concrete, wood Adding details – grass, trees, people Setting up camera and rendering an exterior image | Printing advanced – printing large plans, drawings and posters using a plotter |
| | SEMESTER IV | Setting up interior lighting and exposure Adding details – furniture Setting up camera and rendering an interior image Post-processing – alpha channels, depth of field | Robotic fabrication - basics and Rhino Python workflow integration |
| YEAR III | SEMESTER V | | Importing drawings from other programs Modeling a simple plan – grid, walls, slabs, roofs, doors, windows, stairs, railings Terrain modeling Basic documentation and layouts - pen sets, dimensions, sections and elevations |
| | SEMESTER VI | | Detailed modeling – attributes, fills, composites, materials Advanced documentation – labels, 2D and 3D details Basic rendering of exteriors and interiors |

COMPUTATIONAL DESIGN



- DEFINITIONS**
- COMPUTATIONAL DESIGN**
Methodology which changes the medium of design expression from geometry to logic.
 - PARAMETRIC DESIGN**
Process based on algorithmic thinking that enables the expression of parameters and rules that, together, define, encode and clarify the relationship between design intent and design response.
 - ALGORITHMIC DESIGN**
Design methodology which heavily employ digital data structures and algorithms.
 - GENERATIVE DESIGN**
Iterative design process that involves a program which generates a range of solutions that meet certain constraints. A designer can fine tune the parameters of that process.

COMPUTATIONAL DESIGN WORKFLOW PARADIGMS



SOFTWARE

Jupyter notebooks

Rhino Grasshopper

Rhino Python

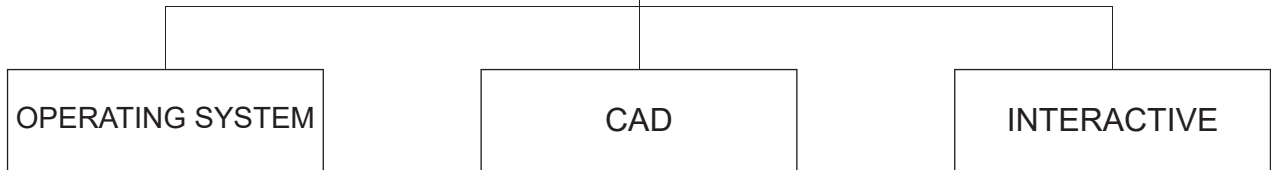
Autodesk Dynamo

Processing

p5js

Unity

Unreal Engine



SOFTWARE

Jupyter notebooks

Rhino Python

Unity

Processing

Rhino Grasshopper

Unreal Engine

p5js

Autodesk Dynamo

UNIVERSAL CONCEPTS OF DIGITAL DESIGN WORKFLOWS

Listed below are universal concepts found in almost all digital design workflows. When learning a new software or a workflow, you can be sure to encounter these in some form. Their ubiquitous nature comes from the fact that they are both extremely useful as well as inherent to the digital medium.

RASTER DATA

In the digital medium, images are represented through a raster data structure based on a tessellation of the 2D plane into cells. These cells are pixels and represent units of color. By combining many small pixels in a grid, a raster image is formed. This is both the way an image is displayed on a computer or TV screen (through an LCD matrix for example) and how it is stored in the computer memory (as a 2D array of values). Each pixel's color is represented through numbers and the way these numbers map onto a specific color is dependent on the color mode (RGB, CMYK, grayscale...) For on-screen graphics the default color mode is RGB, which represents colors through combination of red, green and blue channels in emission spectrum. Manipulation of an image in the digital medium means manipulating these triplets of numbers. All photographs are necessarily stored in the raster format, although it can also be used for drawings and plans, in which case we would say that the drawing is "rasterized". Software which works primarily with raster data is for example Photoshop.

VECTOR DATA

Information which consist of geometric primitives such as points, lines, curves, surfaces, shapes etc. can be more efficiently represented in the form of vector data. This means that only the necessary information needed to reconstruct the geometry is stored while the actual image is recreated when this geometry is viewed. For example, to represent the information about a line, only the location of two endpoints would be stored (these points can be understood as point vectors, hence the name for the data type) and the line itself would be generated as an interpolation of points in between when needed. This makes the data storage much more efficient compared to the raster format. Additionally, vector data is "scaleless" meaning we can freely change the size of the display without compromising quality, which is perfect for displaying plans and drawings and it's an industry standard for architectural plans as well as 3D models. File types which combine raster and vector data called "hybrid" (for example PDF documents which contain images as well as line drawings). Software which works primarily with vector data are for example Rhino, Autocad, SketchUp, Revit, Archicad etc.

LAYERS

Almost every digital design workflow employs some way of structuring data in a layer-based fashion. This means that the data is grouped and ordered in layers or vertical stacks where higher layers cover the layers below. Layers can be named individually to aid organization, hidden from view or locked (still shown but not able to interact with). In raster-based software (Photoshop etc.) layers represent groups of pixels which are collaged on top of each other with different opacity and blending mode. In vector-based software (Autocad, Rhino etc.) different types of lines in a drawing are placed in different layers so they can be more easily managed (line thickness and color assigned to each layer separately etc.) Graphic layout software (InDesign etc.) uses layers to distinguish between different element types (text, vector graphics, images) and video editing workflows can combine layers of video and still images to create elaborate animated illusions.

PARAMETERS

One advantage of using digital design workflows as compared to analogue ones is the parametrization of the process. Parameters are quantitative and qualitative features of the process or a digital output and its parts. We could understand them as the formalization of all the designer decisions and data which flows into the process to create the final output. As these parameters influence the outcome and the process itself in a dynamic way, we can always change and modify them on the fly to get different results. One example would be that if we draw a circle in a vector-based CAD software, it is reasonable to expect that we can always go back and modify the defining parameters of that circle – its center point and radius. Everything which is dependent on these two parameters (colored area inside the circle for example) will change automatically with it. If we draw a circle on a paper, we cannot change it without erasing it first. In a digital medium, this circle is an object defined by parameters, so it can be changed after it was created. This gives us a different feel to working in a digital environment as compared to the analogue one – nothing is really fixed; everything can be changed indefinitely and undone repeatedly. Understanding how different parameters feed into our creative process can increase efficiency as well as expressive power of the medium.

UNIVERSAL CONCEPTS OF DIGITAL DESIGN WORKFLOWS

CODE

All software is run by code. As many digital design workflows are designed to be used by users with no coding experience, they integrate the human in the process by providing easy to use tools. But in the end, even these tools are run by code, and the actions a human designer takes are ultimately translated into coding instructions. This means that everything you can do in a software manually, you can in theory formalize it and turn it directly into code. That's why many software environments provide a way to be used by writing code directly using the software's internal API (Application Programming Interface). All software tools, plug-ins, add-ons and packages are coded using this API. These same principles enable us to use the software in a more powerful way – by directly coding final output. Rhino for example offers a very accessible way to use its API to write plug-ins and execute scripts which run in it, this being the main reason why it has such a large ecosystem of plug-ins and add-ons (for example Grasshopper which itself has its own vast ecosystem of freely available tools). Even though API's are specific for each software, the programming languages used to write the code in them are more universal. Python can for example be used to write code for Rhino, Grasshopper, Processing, Blender etc.

MULTI-SOFTWARE WORKFLOWS

When we talk about digital design workflows, we always talk about several different software and methods which are part of it. When doing an architectural rendering, it is common to do the 3D modeling in one environment (SketchUp, Rhino), actual image rendering in another (V-Ray, Enscape, 3D Studio Max) and then collaging and finishing in another (Photoshop). Similarly, 2D drawings done in Autocad or Rhino could be transferred to Illustrator to fine-tune the graphics, then finally layouted in InDesign together with photographs and text to create a portfolio printed as PDF. Many popular software today are powerful enough to support hybrid workflows (Photoshop can for example handle vector graphics as well) but knowing which software to use for what task is what distinguishes amateur from professional users. Software tailored for specific industries (Archicad for architects for example) often offers a "closed" workflow where many different but connected tasks can be done within the same software (3D modeling and production of ready-to-print plans). Still, there is no "right answer" for which software to use at what time, only good and bad practices, and knowing this comes as much from personal experience as well as education and professional background. It is important to note that software design itself encourages and favors certain workflows over others and introduces bias into them. Therefore, deciding which software to use ultimately is not a neutral decision and can affect efficiency, flexibility as well as quality of the final output.

ANALOGUE PRECEDENCE

Basically all software used in digital design workflows has some analogue workflow precedence which it evolved to replace. Photoshop's roots are in photography studios, Autocad's and Rhino's in drawing boards of engineers and architects. Even when they use essentially the same data types, they often employ tools tailored to different professions. For example, Rhino and Maya both use NURBS and mesh geometries, but the former is tailored to engineers and the later to sculptors. Another example is Autocad and Illustrator, both working with primarily 2D vector data, with Autocad's tools being developed for engineers and Illustrator's for designers and illustrators. Although you might argue that gravity is a very important parameter when designing buildings, neither Archicad nor Revit simulate it directly, even though this software was tailored to architects. On the other hand, Unity and Unreal Engine environments do model gravity not only because it is an essential part of the gaming experience, but also because gaming industry has fewer precedence than construction industry. Again, each one of these uses essentially the same data types to create 3D models and represent built environment, so there are certainly no technical limitations which prevents gravity from being included in these workflows. Despite sometimes marginal differences in the way primary tools in this software are designed, they can still drastically limit or slow down the workflow if used inappropriately. There is some merit in taking time and get acquainted with the software's analogue workflow precedence in order to make the right choice of software.

MOST USEFUL PHOTOSHOP COMMANDS

FILE > Save As: change the file format of your image (JPG, PNG, PDF, PSD...)

FILE > Export > Render Video: use to export an image sequence as a video – useful for creating time lapse videos

FILE > Automate > Batch: apply a script or a recorded sequence of actions to multiple images – useful when you need to edit many images in as same way

EDIT > Transform / Free Transform: perform a geometric transformation of a layer (scaling, rotating, skewing...)

EDIT > Perspective Warp: change a perspective of a layer – useful for approximately “rotating” objects in images or correcting the perspective from a tilted camera view

IMAGE > Mode: change color mode of the image (RGB, grayscale...)

IMAGE > Adjustments: adjust the colors and tones in the layer

IMAGE > Adjustments > Levels: change color levels in the layer – useful for making certain tones in the image more distinct (brighter or darker)

IMAGE > Adjustments > Hue/Saturation: change hue or saturation in the layer – useful to adjust the color values or completely recolorize the image

IMAGE > Adjustments > Invert: inverts the colors in the layer – useful to flip white and black in grayscale images

IMAGE > Image Size: scale the whole image – useful for reducing the file size of the image when you for example want to send it in an email

IMAGE > Canvas Size: change size of the canvas – useful for quickly extending the boundaries of the image

IMAGE > Image Rotation: quickly rotate the whole image

LAYER > New > Layer: add new layer to the document (the layer will be empty and therefore invisible until some pixels are added to it)

LAYER > Duplicate Layer: duplicate a layer – useful if you want to start modifying an existing layer but keep the original one

LAYER > Arrange: change arrangement of layers, the ones on top will cover the ones on the bottom, like in a collage

LAYER > Merge Layers / Flatten Image: merge different layers together or flatten a whole image (all layers will be joined into one) – in a standard compositing workflow you very often end up with many different layers which you eventually start to merge (layers for the sky, clouds, buildings, vegetation, people, objects...)

TYPE > Rasterize Type Layer: convert a vector text into a raster image (background will be transparent)

SELECT > All / Inverse: select all pixels on a layer, or select an inverse area of what is currently selected (if an object is selected, this command will select the background instead)

SELECT > Color Range: select just pixels of a certain color range – useful when you want to isolate objects in an image according to color (copy and paste them into a new layer to isolate them)

FILTER: apply one of many different filters to a layer (blur, sharpen, pixelized, lens flare...)

FILTER > Liquify: maps the image onto a deformable mesh which you can manipulate almost like a fluid – useful for creating large local distortions

ZOOM > Fit on Screen: fit the whole image neatly on the screen

WINDOW > Workspace > Essentials: add all the classic toolbars to the Photoshop workspace – useful when you accidentally hide a toolbar you need and you are not sure how to get it back

WINDOW > Actions: turns on a tab where you can record a sequence of actions (click on New Action) and execute it later – these actions can be used on many images at the same time using Batch command (File > Automate > Batch)

WINDOW > History: turns on a tab with the list of previously taken actions and states of the image – just click on the previous state to restore it

WINDOW > Layers: turns on a tab with the list of all layers. Here you can manually arrange the order of layers by just dragging, setting the opacity (transparency) and blending mode (how are the pixels in this layer displayed based on the pixels from the layers below)

MOST USEFUL PHOTOSHOP SHORTCUTS

V - Move tool: moves a selection or a layer

M - Rectangular marquee tool: makes a selection in a shape of a rectangle

L - Lasso tool: makes freehand selections

W – Object selection tool: finds and automatically select an object inside a defined region – this feature is very useful when you need to quickly cut out an object with a complex boundary

J – Spot healing brush tool: removes marks and blemishes in an image – useful when you need to quickly remove a small area of pixels which are embedded in the background, this tool will try to reconstruct the background for you

S – Clone stamp tool: paints with pixels from another part of the image – useful to seamlessly copy objects and textures from the same image (for example when adding textured objects like plants and trees)

O – Dodge / Burn tool: taken directly from an analogue photograph development process, dodge lightens the areas in an image while burn darkens them – useful to add realistically colored shadows or sunny spots in the image

Q – Edit in quick mask mode: this mode shows your selection in terms of colored pixels (red are is not selected) so you can freely “paint” your selection – useful when you need to select a complex shape – note that you can combine your selection with a blending mode, which means that you can select something at 50% for example (this will create a semi-transparent selection)

KEY INSIGHTS FOR THE PHOTOSHOP WORKFLOW

PIXELS

Photoshop works primarily with raster data, meaning with images and their pixels. Every digital raster image is composed of a certain number of pixels (depending on its resolution) which are stored in a memory as a collection of numbers. These numbers represent a specific color and the way they map onto the color space is dependent on the color mode. The default color mode we use for digital graphics is RGB where every pixel is represented through an addition of red, green and blue color in the emissive spectrum. This is the same way the color is determined on your computer or TV screen. Every raster image therefore has its red, green and blue color channel. Additionally, alpha channel describes transparency of the pixel. Combined, these four channels describe everything that happens to pixels in an image and all image altering operations are in some way related to manipulating those four channels.

LAYERS

Final image can be “flat” meaning that it consists of one layer, or it can be created as a composite of multiple layers. These layers can contain parts of an image, they can be irregular in shape and have different blending modes and transparency. Layers are an essential way how images in Photoshop and many other software are organized. The best analogy is to think of your image as a collage consisting of different pieces which all come together to create an image.

SPATIAL ILLUSION

Because it's based on a collaging technique, images in Photoshop are not truly three-dimensional, but they can create an illusion of a third dimension. This is very different from a way 3D modeling software works, where the objects we manipulate are represented as three-dimensional objects. In raster-based workflows like Photoshop, spatiality is always an illusion created from essentially flat parts. Rules to create seemingly three-dimensional compositions are not inherently digital but universal and relate to the human visual perception. To learn these rules and how to employ them in your collages, it is best to refer to more traditional sources for art production. Without this knowledge, it is hard to use Photoshop's powerful image processing tools to their full potential.

ANALOGUE PRECEDENCE

Many of the digital tools Photoshop provides are directly inspired and modeled after analogue photo-processing techniques used in photo studios (for example dodge and burn). Others are inspired by artistic techniques like painting, drawing and collaging. Because of this, Photoshop can be used for the same purposes – to develop and alter photographs, or to create paintings and drawing from scratch like an artist. Greatest potential lies in combining these two workflows, with professional images being a combination of elaborate collages which were “painted” over. Image outputs from rendering software need to be additionally reworked in Photoshop in order to reach professional quality.

MOST USEFUL RHINO COMMANDS

Align: allows you to align objects to an existing reference line to get it on the plane that you want

* **Array:** automatically copies and pastes lines equally spaced apart

BooleanDifference: allows you to subtract a solid shape from another solid leaving a fully intact solid without the material from the subtracted shape behind – note in order to do this the objects must be fully closed solids and the two objects must intersect each other

BooleanUnion: allows you to join two solids with no overlapping edges internally- note in order to do this the objects must be fully closed solids and the two objects must intersect each other

Boolean2Objects: lets you run through the full list of boolean commands until you find the one you want to use – note in order to do this the objects must be fully closed solids and the two objects must intersect each other

ExtrudeCrv: gives height to a curve

ExtrudeSrf: gives a thickness to a surface

* **Explode:** makes a joined/grouped object or polyline explode into individual parts

* **Extend:** extends a curve or a line to a boundary

Cap: closes an object that you've split or extruded to form a solid – not only works when the surfaces are planar

ClippingPlane: shows you a cut through of a particular part of an object without actually splitting it in the model; for a specific view port, click on the plane and use "EnableClippingPlane" to turn it on and "DisableClippingPlane" to turn it off in that viewport

CloseCrv: closes a curve; we suggested that you only use it if you can't figure out where the curve is open yourself

Contour: create a spaced series sections (planar curves and points) through objects - great for laser cutting topographies (similar to Section command)

* **Copy:** allows you to copy an object from a specific spot multiple times

* **Curve:** draws a spline

* **Distance:** measures the distance between two things

* **DupEdge:** duplicates the edge of an object

* **Fillet:** makes an angle or edge rounded

FlowAlongSrf: Flow a pattern or an object along an irregular surface

* **Group/Ungroup:** joins/unjoins multiple objects or curves
Helix: makes a spiral (useful for slinkies, screws, coils)

* **Join:** joins multiple connected units

* **Line:** draw a single line segment

Loft: creates a surface between two lines or shapes

* **Make2D:** creates a basic line drawing of your 3D model; in the options you can choose to show lines hidden by the solid form of the object, to keep lines separated by layer, or to make lines tangent which helps to join some of them when they're made 2D; this is useful when you export to Illustrator for linework

* **Mirror:** mirrors an object or drawing across a reference line

* **PictureFrame:** places a picture in your model

* **Polyline:** creates a continuous string of straight lines

* **Point:** creates a point (on a line or to use to join with a line)

* **PointsOn:** allows you to edit a curve or shape that you've already made

PlanarSrf: gives a surface to a closed curve

Project: projects curves or surfaces along an irregular surface; make sure that the curve/surface is directly above or below the surface to which you want to project; "ProjecttoCPlane" is useful in flattening lines you didn't realize were on different planes to a flat layer

* **Rotate / Rotate3D:** rotates an object around an axis

* **Offset:** allows you to offset a line or shape a certain distance away

Section: creates section cuts through an object – great for laser cutting topographies (for spaced series of sections use Contour command)

* **SelDup:** selects duplicates in the model (similar to overkill in AutoCAD)

* **Show/Hide:** show makes objects visible, hide makes them invisible

* **Scale:** proportionally scales things larger or smaller

* **Scale1D:** scales something in one direction only

* **Split:** splits apart surfaces, lines

Sweep (1 & 2): creates a thickness by "sweeping" a shape along a curve

* **Text:** creates text

* **Trim:** allows you to trim intersecting lines

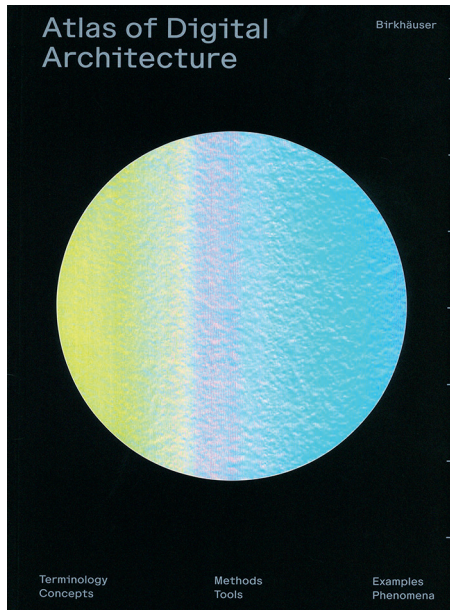
Turntable: automatically rotates your object

UnrollSrf: explodes a closed object into multiple planes – great for making laser cutting files!

* **ZS:** zooms one object in one view

ZSA: zooms in on one object in all 4 views

READINGS



ATLAS OF DIGITAL ARCHITECTURE

Digital technology and architecture have become inseparable, with new approaches and methodologies not just affecting the workflows and practice of architects, but shaping the very character of architecture. In this compendious work, two dozen university professors and lecturers share their vast range of expertise with a professional writer who assembles this into an array of engaging, episodic chapters. Structured into six parts, the Atlas offers an orientation to the myriad ways in which computers are used in architecture today, such as: 3D Modelling and CAD; Rendering and Visualisation; Scripting, Typography, Text & Code; Digital Manufacturing and Model Making; GIS, BIM, Simulation, and Big Data & Machine Learning, to name but these. Throughout, the Atlas provides both a historical perspective and a conceptual outlook to convey a sense of continuity between past, present, and future; and going beyond the confines of the traditional textbook, it also postulates a theoretical framework for architecture in the 21st century. The Atlas of Digital Architecture then understands itself as an invitation to the rich feast of possibilities and professional profiles that digital technology puts on the table today, and hopes to whet the reader's appetite for exploring and sampling their great potential.

Editors: Ludger Hovestadt, Urs Hirschberg, Oliver Fritz

Contributors: Diana Alvarez-Marin, Jakob Beetz, André Borrmann, Petra von Both, Harald Gatermann, Marco Hemmerling, Ursula Kirschner, Reinhard König, Dominik Lengyel, Bob Martens, Frank Petzold, Sven Pfeiffer, Miro Roman, Kay Römer, Hans Sachs, Philipp Schaerer, Sven Schneider, Odilo Schoch, Milena Stavric, Peter Zeile, Nikolaus Zieske

Writer: Sebastian Michael

Design and Layout: Onlab

Publisher: Birkhäuser

First published in: 2020

<https://www.atlasofdigitalarchitecture.com/>